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which are briefly as follows: Contrary to FITTING's conclusion, in a combination of the rest position with various angles, the statolith starch takes the position that would be expected by the statolith theory. Centrifugal acceleration causes the movement of the starch that the hypothesis assumes, as shown by accelerations from 0.13 g to 9 g. In these various accelerations the time of the movement of the starch to the side of the cells coincides with the presentation time as determined by BACH. In the intermittent exposures of opposite sides when these exposures are of short duration the starch moves to the side of the cell of the most effective exposure only after the process is long continued, corresponding to the slow reaction in these cases. However well this paper may answer a number of the arguments against the statolith theory, there are yet a number unanswered and this whole matter of geotropic reaction seems too complex to be entirely explained in such a simple way.—WM. CROCKER.

Ray-tracheids in *Cunninghamia*.—The complex structure of the medullary rays of living Abietineae, consisting of parenchyma cells, ray-tracheids, and an elaborate system of ligneous resin-canals, has been used as one of the evidences of a highly specialized and relatively modern group. JEFFREY²⁷ has studied the marginal ray-tracheids that occur occasionally in *Cunninghamia* and has found them to be due to wounding, being most numerous in the region of the injured annual rings oppositely the wound-callus. They resemble in general those described for certain genera of the Taxodineae and Cupressineae, and JEFFREY thinks that this is additional evidence that these two tribes have been derived from the Abietineae, the ray-tracheids being "vestigial or reversionary." He emphasizes this view by calling attention to the fact that there is no evidence that the Taxodineae and Cupressineae existed before the end of the Cretaceous. Such conclusions illustrate the fact that apparent simplicity of structure may not indicate greater antiquity than greater complexity of structure.—J. M. C.

Vascular system of Ranales.—WORSDELL²⁸ maintains that the primitive angiosperms had large leaves, and that as a result the vascular bundles were disposed in a scattered manner, as is seen in the monocotyledons. He considers that there is in all cases a single terminal cotyledon in the embryo, but that it may split and the halves diverge through 180°. Like the cotyledon, all the leaves are terminal organs, and hence dominate the stem ("grandifoliolate"). From this condition has been derived the one in which the stem is dominant and the leaves small ("parvifoliolate"). This view of phylogeny naturally leads WORSDELL to reject the evidence derived from the vascular system of seedlings adduced by JEFFREY and others, although he claims to adopt the "recapitulation theory." In the present paper he outlines the results of an extensive study of the leaves in

²⁷ JEFFREY, EDWARD C., Traumatic ray-tracheids in *Cunninghamia sinensis*. *Annals of Botany* 22:593-602. *pl.* 31. 1908.

²⁸ WORSDELL, W. C., A study of the vascular system in certain orders of the Ranales. *Annals of Botany* 22:651-682. *pls.* 32, 33. 1908.

certain representatives of Ranales, and shows how the scattered bundles of a petiole may be converted into a ring, and the bundles of one side of the ring approximate the opposite side so as to produce a single arc.—M. A. CHRYSLER.

Solution of mitoses.—Experiments of OES²⁹ with various root tips, embryo sacs, and pollen mother cells show that cells capable of growth and division contain a chromatin-dissolving enzyme (*nuclease*), which dissolves chromatin when toluol, chloroform, carbolic acid, etc., are added. Metaphases, anaphases, and telophase are most quickly attacked, the prophase being less susceptible, and the resting nucleus still more resistant. In autolyzed objects the spindle is dissolved, but the nucleolus and nuclear membrane of resting nuclei remain unaffected. The effect of temperature, neutral salts, free acids, and alkalies was observed in various objects. The writer believes that the diminution of chromatin in the telophase, observed by STRASBURGER and others, may be due to nuclease. If nuclease functions in the normal, living plant, thus causing irregular fluctuations in the chromatin, the question arises whether chromatin is the exclusive bearer of hereditary qualities.—CHARLES J. CHAMBERLAIN.

Tyloses in tracheids of Conifers.—CHRYSLER³⁰ has reinvestigated this subject, and finds tyloses in the heart wood of the root, and in the first year's growth of the axis of the strobilus. So far as his work goes, they are confined to *Pinus*, the examination of the root wood of 12 other genera and of the cone axes of 7 other genera failing to reveal them. The effect of wounding was also studied, but it did not result in extending the range of tyloses, either to other genera or to other regions of *Pinus*; but wounding did result in inducing the occurrence of tyloses in the normal regions of *Pinus*. It is suggested that these facts may provide an additional reason for considering *Pinus* to be an ancient genus.—J. M. C.

Plant diseases.—STEWART and HODGKISS in a recent bulletin³¹ discuss the carnation bud rot previously described by HEALD and WOLCOTT of the Nebraska Experiment Station. It is a disease which is known to occur in New York, Illinois, and Nebraska, and which is attributed to a species *Sporotrichum* with the association of a species of mite.

The disease of grass known as silver top is also discussed in this same bulletin and attributed to the same fungus in association with the same mite, though the relation of the mite to infection has not been completely worked out in either case.—F. L. STEVENS.

²⁹ OES, ADOLF, Ueber die Autolysis der Mitosen. Bot. Zeit. 66:89-120. *pl.* 5. 1908.

³⁰ CHRYSLER, M. A., Tyloses in tracheids of Conifers. New Phytol. 7:198-204. *pl.* 5. 1908.

³¹ STEWART, F. C., AND HODGKISS, H. E., Tech. Bull. 7, N. Y. Agric. Exper. Sta. Oct. 19, 1908.